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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,858	03/24/2004	Michael B. Korzenski	ATMI-694	5492
24239	7590	10/24/2006		
MOORE & VAN ALLEN PLLC P.O. BOX 13706 Research Triangle Park, NC 27709			EXAMINER AHMED, SHAMIM	
			ART UNIT 1765	PAPER NUMBER
DATE MAILED: 10/24/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/807,858

Applicant(s)

KORZENSKI ET AL.

Examiner

Shamim Ahmed

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/17/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 8/11/06 have been fully considered but they are not persuasive.

As to the 112, first paragraph rejection, applicants argue that the composition will inherently include at least one implanted ion because the composition is used for stripping or removing ion implanted photoresist at least during the initiation of the removal process of claim 36.

In response, examiner states that the composition will not inherently includes a material, wherein the composition itself does not contain the material such as the "at least one implanted ion".

As to claim 35, which limitation is now incorporated into claim 15, applicants argue that Sehgal does not teach removal of the ion implanted photoresist with the temperature range of 50-90 degree C.

In response, examiner states that Sehgal teaches the temperature of the super critical fluid will be much higher than critical temperature of 31 degree C (paragraph 0010) and that could be 55 degree C as explained in example 1 (paragraph 0074).

Sehgal also teach the higher temperature (about 80 degree) and pressure will accelerate the stripping of photoresist using the supercritical fluid (paragraph 0058) and one skilled in the art would have been motivated to do so for accelerating the stripping rate.

Applicants also argue that combination of Sehgal and De Young is not permissible because Sehgal is relating with single step removing process, whereas De Young is dealing with multi-step process.

In response, examiner states that the argument is not commensurate with the claims and additionally, De young reference is not applied to show the steps of the process but to show the use of both the triethylamine trihydrofluoride and hydrogen fluoride in the stripping of photoresist material (see the rejection).

As to the double patenting rejection, the rejection is repeated herein because terminal disclaimer is not filed yet.

Amendment to the claim 15 is sufficient to overcome the 102 rejection over Sehgal and accordingly the 102 rejection is withdrawn and a revised rejection is as follows:

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 36 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specification sections of paragraphs [0016] and [0030] as applicants mention in the previous response do not provide support for the

Art Unit: 1765

limitation of “the removal composition comprising at least **one implanted ion**”. In the above sections, specification just discloses removal of the ion implanted photoresist using the SCF based composition but nowhere in the specification discloses that the composition comprises at least one implanted ion.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 15-23,25-27,30,35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1).

Sehgal teaches a process for removing photoresist or BARC using a composition in which the composition comprises supercritical fluid (SCF) of carbon dioxide, co

Art Unit: 1765

solvent such as isopropanol (paragraphs 0017,0028-0029 and 0069) and hydrogen peroxide (paragraph 0043).

Sehgal teaches that the composition may include ammonium fluoride (paragraph 0048), wherein the oxidizer or the ammonium fluoride may work as the claimed etchant.

Sehgal teaches the composition may include surfactant, which may be anionic, cationic or non-ionic (see paragraphs 0045 and 0060).

Sehgal also teaches the composition may include accelerator to the co-solvent mixture such as sulfuric acid (paragraph 0053).

Sehgal teaches the temperature of the super critical fluid will be much higher than critical temperature of 31 degree C (paragraph 0010) and that could be 55 degree C as explained in example 1 (paragraph 0074).

Sehgal also teaches the higher temperature (about 80 degree) and pressure will accelerate the stripping of photoresist using the supercritical fluid (paragraph 0058).

Therefore, it would have been obvious to one of ordinary skilled in the art would have been motivated to do so for accelerating the stripping rate.

As to claim 37, Sehgal teaches the use of isopropyl amine in the composition including SCF (see claim 21).

7. Claims 24,28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 and 35 above, and further in view of De Young et al (6,669,785).

As to claim 24, Sehgal discloses above in the paragraph 6 but fail to teach the etchant could comprises triethylamine trihydrofluoride.

Art Unit: 1765

However, De Young et al disclose a composition for removing photoresist/antireflective coating with additives such as hydrogen fluoride or triethylamine trihydrofluoride (col.2, lines 26-41 and col.4, lines 43-65).

As to claims 28-30, since the photoresist and the BARC material is removing, it would have been obvious to have residual amount of the above materials present in the removing solution.

8. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 above, and further in view of Xu et al (US 2003/0125225).

Sehgal discloses above in the paragraph 6 but fail to teach the repetitive carrying out the dynamic flow contacting and static soaking contacting the substrate to be cleaned.

However, Xu et al teach a cleaning/removal process of unwanted residue including unexposed photoresist using supercritical fluid composition as claimed including the steps of contacting the fluid to the substrate by flowing and repeated cycles of soaking to achieve substantially complete removal of the unwanted materials from the substrate (paragraphs 0059-0061).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Xu et al's teaching into Sehgal's process for complete removal of the residual material in order to have a cleaned surface as taught by Xu et al.

Art Unit: 1765

9. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 above, and further in view of Hess et al (6,627,588).

Sehgal discloses above in the paragraph 6 but fail to teach the removal process involve the removal of ion implanted photoresist.

However, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to remove the ion-implanted photoresist as Hess et al teach the conventional removal of photoresist and ion implanted photoresist using isopropanol (abstract and col.1, lines 50-61).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Hess et al's teaching into Sehgal's process for efficient cleaning of the ion implanted photoresist as well as the photoresist in order to have cleaner surface to work with in the subsequent processing.

In the above, examiner assuming the implanted ion came from the ion-implantation of the substrate prior to the removal process.

### ***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir.



Art Unit: 1765

1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 15-17,20-23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 49-64 of copending Application No. 10/602,172 (US 2004/0266635 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other because the cleaning process of the copending application broadly encompasses the removal process of BARC material of the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Agarwal (6,306,754) teaches typical temperature and pressure are maintain during the photoresist removal using super critical fluid such as carbon dioxide (col.6, lines 38-49).

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 1765

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

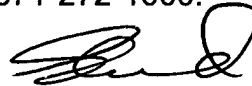
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
October 22, 2006